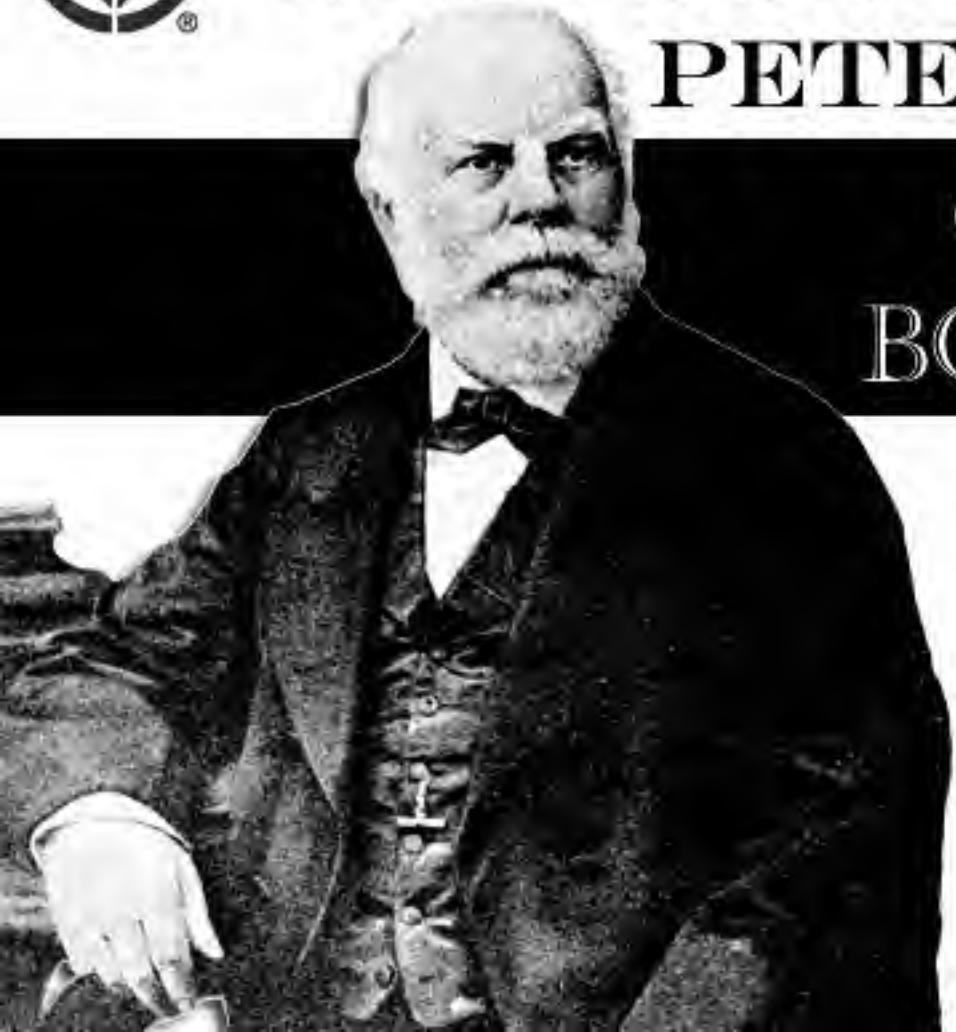




MISSOURI BOTANICAL GARDEN

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GEORGE ENGELMANN BOTANICAL NOTEBOOKS

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September 16, 1861.

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Six members present.

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Dr. Engelmann exhibited specimens and numerous drawings of two species of *fungi*, which infest our vineyards to such an extent as to materially diminish the crop and influence the culture of the grape, at least that of the Catawba, in our region. The first is a species of *Botrytis*, and perhaps the same as Berkeley's *B. viticola*, (very near *B. acinorum*, Pers.?) It makes its appearance in the latter part of June, on the lower downy surface of the leaves of the Catawba variety of *Vitis Labrusca*, (the only one extensively cultivated here,) forming irregular confluent spots. The horizontal fibres of the mycelium have a diameter of 0.005 line, finer and whiter than the hair of the down with which they are interwoven; the erect fructiferous stems, about 0.3-0.4 line high, and a little thicker than the horizontal fibres, bear numerous horizontal branches, upwards gradually shorter, the last divisions of which form very short pedicels, always 2 or 3 together, bearing oblong or oval, very deciduous spores, 0.008-0.011 lines in the longer diameter. About the same time the mildew appears on the pedicels, and often also on the young berries when they are of the size of small peas or smaller; Dr. E. never saw it on full grown berries. Those attacked on their surface or on their pedicels soon fall off; but the most material damage is done by the mildew infesting the leaves, whereupon the greater part of the berries will gradually turn yellowish-brown at their base, shrivel from that point, assume a club shape, and at last dry up entirely, usually remaining adherent to the withered racemes. This he designated as the *brown rot*.

The second kind of rot—the *black rot*—is brought on by a very different fungus, which he believed was undescribed by botanists. It evidently belonged near Ehrenberg's genus *Nemaspora*, and ought to bear the name *ampelicida*. It makes its appearance only on nearly full grown berries, exhibiting in the first stage a discolored spot on the side, but never at the base of the berry, about 2 lines in diameter, with a dark dot in the centre. This spot soon becomes light brown and remains so, while the surrounding part of the berry gets darker, and exhibits a rough or (under a magnifier) pustulous surface; gradually, now, the berry shrivels up and turns black. The individual fungi are little spherical bodies, (0.07-0.10 line in diameter,) formed under the surface in large numbers, which, growing, elevate, and at last burst the epidermis, then open at their apex by a small jagged hole, and, shrivelling with the berry, eject a more or less curled or twisted thread, which, moistened, becomes gelatinous, and shows the innumerable oval sporules, (0.004-0.005 line long,) each imbedded in its coat of mucilage.

These kinds of fungi are found either on distinct vines, or sometimes also on the same; they are very rarely seen on grapes cultivated in yards

MISSOURI
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1861

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Whether other diseases assist in the destruction of the grape, as wine-growers will have it, he cannot, from his own experience, determine. He has never seen the *Erysiphe*, which is so destructive to the gooseberry, and to vines in graperies, on grapes cultivated in the open ground.

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The Cactus fruit is usually succulent; only some Echinocacti and some *Opuntiæ* are known to bear dry fruits. The succulent fruit consists of the fleshy walls of the fruit itself, originating from the carpel and the adhering calyx, (or part of the stem, as Zuccarini will have it,) coalescing and forming a homogeneous mass, and of the juicy pulp, in which latter the seeds are imbedded. In some species the parenchyma of the walls, in others the mass of the pulp, prevails. The pulp is always the product of the funiculus or its appendages. The funiculus, even at the flowering period, bears on its inner side a beard of transparent fibres, 0.01-0.10 line in length; the fruit maturing, these fibres are enlarged, and the whole cellular tissue of the funiculus becomes, as it were, hypertrophic, every cell swelling up, filling with a sweetish, mostly red-colored juice; at last the cells in most species separate from one another, and leave the seeds floating in the pulp attached only to the slender spiral vessels. The mass of the funiculi and their proportion to the mass of the seed is very different in different species; in *Lepismium Myosurus* it constitutes only $\frac{1}{6}$ or $\frac{1}{8}$ of the seed; in *Mamillaria Nuttallii* it bears, perhaps, a still smaller proportion; while in other *Mamillariæ*, e. g. *M. polythele* and

M. pusilla, it is 2-4 times larger than the seed. In *Cereus*, such as *C. triangularis*, it is far the largest, variously compressed, 0.03 l. long, while in *C. giganteus* it is 0.08 l. long, while in *C. hexaedrophylloides* it is 0.12 l. long. The genus *Opuntia* is represented by species with juicy cells, which are numerous and of the rather irregular shape, covering the surface of the seed. The analogy of the other genera of the family shows that the nature of the arillus, the epidermis only to the base, soon after fecundation becomes disconnected and twisted, so that the surface of the seed is perfectly straight, on the contrary, and twisting in different directions. The *Opuntiæ* are represented by species with juicy cells, which I take to be the remains of them at their first appearance, having a diameter only about one-third of the seed, and twice the diameter of the seed. The ones are 0.3-0.5 l. long, and become at last jointed, becoming larger than the base of the seed. During the growth, these cells attain full maturity, and soon separate, forming a pulp. The cells are mostly oval, and have a structure in *O. Engelmanni* similar to that of *O. hexaedrophylloides* in autumn, and it becomes juicy fruit.

In *O. Rafinesquei* the cells on the face of the seed are elongated, producing the pulp.

O. Pes Corvi, remains pale red colour.

any change, until it becomes yellow.

In *O. Brasiliensis* the cells are elongated, forming a pulp similar to that of *O. hexaedrophylloides*.

slender joints, 0.01-0.10 line in diameter or otherwise.

unripe fruit late in the year, and it has been unable to ascertain any change, until it becomes yellow.

No such development of the pulp in *O. hexaedrophylloides* with dry seed, consequently the pulp is dry.

The cells of the pulp of the *Opuntiæ* with dry seed, consequently the pulp is dry.

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JOURNAL OF PROCEEDINGS.

[167]

(167)

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The genus *Opuntia* apparently differs in having the whole seed covered with juicy cells, which, in size and quantity, vastly predominate over the cells of the rather insignificant funiculus proper. But the whole bony coating of the seed being but an arillary enlargement of the funiculus, (Cact. Mex. Bound., p. 76,) this peculiar case entirely falls into the analogy of the other *Cactaceæ*. The real difference is caused by the nature of the arillus, which, getting extremely hard, leaves the cells of the epidermis only to grow out, and finally to form the pulp of the fruit. Soon after fecundation these cells gradually become elongated, cylindrical, and disconnected among one another, rising perpendicularly from the surface of the seed; they are shorter, of nearly equal length, and perfectly straight, on the faces of the young seed, and longer, hair-like, and twisting in different directions on and near the rim. In *O. glaucocephylla*, which I take to be a mere variety of *O. Ficus Indica*, I find them at their first appearance on a seed of less than one line in diameter only about 0.004 l. long and wide; on the rim they soon grow to twice the diameter and ten times the length, till at maturity the larger ones are 0.3-0.5 l. long. These cells, at first simple and cylindrical, become at last jointed and clavate, the terminal cells being many times larger than the basal ones, thus properly filling the interstices between the seeds. During winter, the fruit and seeds having reached their full growth, these cells contain a colorless, viscous, insipid fluid; in the following spring, when the fruit has assumed a deep purple colour, and attained full maturity, they contain a sweetish, purple liquid, and soon separate, forming what is properly called the pulp. The single cells are mostly oval or oblong, 0.02-0.20 l. in length. I find the same structure in *O. Engelmanni*, which, however, ripens its fruit, with us, in autumn, and it undoubtedly obtains in all *Opuntiæ* with large and juicy fruit.

In *O. Rafinesquii*, and probably in all species with less juicy fruit, the cells on the face of the seed are not developed, only those on the rim producing the pulp, which in this species as well as in *O. vulgaris* and *O. Pes Corvi*, remains, even at full maturity, insipid and viscous and of pale red colour. In this condition the fruit adheres to the plant, without any change, until it falls off in the following spring.

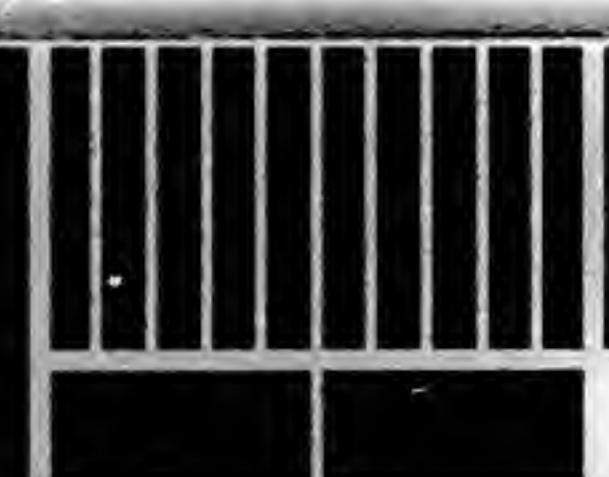
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No such development of the epidermis-cells seems to take place in the *Opuntiæ* with dry fruit, such as *O. Missouriensis*, *O. clavata*, etc.; the seed, consequently, has a whiter, polished, ivory-like surface, while that of the juicy *Opuntiæ* fruits is dull and almost rough, and not so white.

The cells of the parenchyma of the fruit, as well as those of the bony seed-coat, are full of aggregations of crystals; those of the funiculus proper contain fewer and smaller clusters; but in the pulp itself I have never seen them; neither could I discover any in the parenchyma, or in the pulp of the fruits of *Mamillariae*.

Dr. J. S. Newberry, of Cleveland, O., and Prof. Chas. T. Jackson, of Boston, Mass., were elected Corresponding Members.

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MISSOURI
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October 21, 1861.

The President, Dr. ENGELMANN, in the chair.

Seven members present.

A letter was read from Dr. Charles T. Jackson, of Boston, acknowledging his election as a Corresponding Member.

The following donations to the library were received :

Rep. on the Economical Geology of the Route of the Ashtabula & Lisbon Railroad, by J. S. Newberry, M.D., Cleveland, 1857,—Rep. on the State-house Well, by J. S. Newberry,—Catalogue of Flowering Plants and Ferns of Ohio, by J. S. Newberry, M.D., 1860, *from the Author*; Proc. Boston Society Natural History, Sept. 1861, *from the Society*; Journal of the Franklin Institute, October, 1861, *from the Institute*; Bull. de la Soc. Imp. zool. d'Acclimatation, Paris, No. 9, 1861, *from the Society*; Canadian Nat. & Geologist, and Proc. Nat. Hist. Soc., Montreal, Vol. VI., No. 5, Oct. 1861, *from the Society*; Proc. Acad. Nat. Sciences, Philad., Aug. 1861, *from the Academy*; Faune Primordiale dans la Chaine Cantabrique, par Casiano de Prado, Ed. de Verneuil, et J. Barrande, Paris,—Dépôt organique dans les loges aériennes des Orthocerés, par J. Barrande,—Obs. sur quelques genres de Céphalopodes Siluriens, par J. Barrande,—Extension de la Faune Primordiale de Bohémie, par J. Barrande,—Colonies dans le basin Silurien de la Bohémie, par J. Barrande,—Troncation normale ou périodique de la coquille dans certains Céphalopodes paléozoïques, par J. Barrande,—Notes sur quelques nouveaux Fossiles dans le basin Silurien du centre de la Bohémie, 1855, par J. Barrande,—Le Système Taconique en Amérique, par J. Barrande, 1861,—Graptolites de Bohémie, par J. Barrande, 1850,—Analyse du travail de M. Ed. Suess sur les Brachio-podes de la Collection de Vienne, par M. Deshayes,—Notice biographique sur Mercier de Boissy, par M. D'Archiac, 1856,—Notice sur la vie et les travaux de Jules Haime, par M. D'Archiac, 1856,—Notes on the Cretaceous and Carboniferous Rocks of Texas, by Jules Marcou, Boston, 1861,—Lettres sur les Roches de Jura, par Jules Marcou, Liv. 2, Paris, 1860,—Parallèle entre les Dépôts Siluriens de Bohémie et de Scandinavie, par J. Barrande, Prague, 1856, *from Prof. Jules Marcou*; Primordial Zone of Texas, with Descriptions of New Fossils, by B. F. Shumard, 1861, *from the Author*.

Dr. Shumard presented *Exogyra arietina* from the Cretaceous of Texas, and several *Naiades* from the Ohio River.

Dr. Shumard called the attention of the Academy to a new Crustacean from the Cretaceous of Hempstead Co., Ark., presented to the museum by Dr. Koch. Dr. Shumard proposed for it the name *Mesostylus Americanus*.

Dr. Shumard exhibited a series of specimens of his *Ostrea subovata* (*O. Marshii*, *Marcou*) from the Washita Limestone of Fort Washita and Austin, Texas, and among them the original specimen described by him in Marcy's Report.

Prof. Joachim Barrande, of Prague, Bohemia, was elected a Corresponding Member.

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GEORGE ENGELMANN PAPERS



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Fungi on Vitis, (Cactus from L.)

Transact. vol II, p 165, number 1.

1863

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October 21, 1861.

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Seven members present.

A letter was read from Dr. Charles T. Jackson, of Boston, acknowledging his election as a Corresponding Member.

The following donations to the library were received:

Rep. on the Economical Geology of the Route of the Ashtabula & New Lisbon Railroad, by J. S. Newberry, M.D., Cleveland, 1857,—Report on State-house Well, by J. S. Newberry,—Catalogue of Flowering Plants and Ferns of Ohio, by J. S. Newberry, M.D., 1860, *from the Author*; Proc. Boston Society Natural History, Sept. 1861, *from the Society*; Journal of the Franklin Institute, October, 1861, *from the Institute*; Bull. de la Soc. Imp. zool. d'Acclimatation, Paris, No. 9, 1861, *from the Society*; Canadian Nat. & Geologist, and Proc. Nat. Hist. Soc., Montreal, Vol. VI., No. 5, Oct. 1861, *from the Society*; Proc. Acad. Nat. Sciences, Philad., Aug. 1861, *from the Academy*; Faune Primordiale dans la Chaine Cantabrique, par Casiano de Prado, Ed. de Verneuil, et J. Barrande, Paris,—Dépôt organique dans les loges aériennes des Orthocerés, par J. Barrande,—Obs. sur quelques genres de Céphalopodes Siluriens, par J. Barrande,—Extension de la Faune Primordiale de Bohémie, par J. Barrande,—Colonies dans le basin Silurien de la Bohémie, par J. Barrande,—Troncation normale ou périodique de la coquille dans certains Céphalopodes paléozoïques, par J. Barrande,—Notes sur quelques nouveaux Fossiles dans le basin Silurien du centre de la Bohémie, 1855, par J. Barrande,—Le Système Taconique en Amérique, par J. Barrande, 1861,—Graptolites de Bohémie, par J. Barrande, 1850,—Analyse du travail de M. Ed. Suess sur les Brachiopodes de la Collection de Vienne, par M. Deshayes,—Notice biographique sur Mercier de Boissy, par M. D'Archiac, 1856,—Notice sur la vie et les travaux de Jules Haime, par M. D'Archiac, 1856,—Notes on the Cretaceous and Carboniferous Rocks of Texas, by Jules Marcou, Boston, 1861,—Lettres sur les Roches de Jura, par Jules Marcou, Liv. 2, Paris, 1860,—Parallèle entre les Dépôts Siluriens de Bohémie et de Scandinavie, par J. Barrande, Prague, 1856, *from Prof. Jules Marcou*; Primordial Zone of Texas, with Descriptions of New Fossils, by B. F. Shumard, 1861, *from the Author*.

Dr. Shumard presented *Exogyra arietina* from the Cretaceous of Texas, and several *Naiades* from the Ohio River.Dr. Shumard called the attention of the Academy to a new Crustacean from the Cretaceous of Hempstead Co., Ark., presented to the museum by Dr. Koch. Dr. Shumard proposed for it the name *Mesostylus Americanus*.Dr. Shumard exhibited a series of specimens of his *Ostrea subovata* (*O. Marshii*, *Marcou*) from the Washita Limestone of Fort Washita and Austin, Texas, and among them the original specimen described by him in Marcy's Report.

Prof. Joachim Barrande, of Prague, Bohemia, was elected a Corresponding Member.

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